#31 $\frac{(x+3)(x+1)}{3}$

Answers p 552

In Exercises 23–34, simplify the complex fraction.

23. $\dfrac{\left(\frac{x}{3}-4\right)}{\left(5+\frac{1}{x}\right)}$ $\frac{x(x-12)}{3(5x-1)}$

24. $\dfrac{\left(\frac{4}{x}+2\right)}{\left(\frac{1}{2x}-8\right)}$ $\frac{4(2+x)}{(1-16x)}$

25. $\dfrac{\left(\frac{3}{x^2}+\frac{1}{x}\right)}{\left(2-\frac{4}{5x}\right)}$ $\frac{(5x+3)}{2x(5x-2)}$

26. $\dfrac{\left(16-\frac{1}{x^2}\right)}{\left(\frac{1}{4x^2}-4\right)}$ -4

27. $\dfrac{\left(\frac{10}{x+1}\right)}{\left(\frac{1}{2}+\frac{3}{x+1}\right)}$ $\frac{20}{x+7}$

28. $\dfrac{\left(\frac{2}{3x+15}\right)}{\left(\frac{2}{x+5}+\frac{1}{4x+20}\right)}$ $\frac{8}{27}$

29. $\dfrac{\left(\frac{1}{2x+1}-\frac{3}{4(2x+1)}\right)}{\left(\frac{x}{2x+1}\right)}$ $\frac{1}{4x}$

30. $\dfrac{\left(\frac{2}{x^2-1}+\frac{1}{x+1}\right)}{\left(\frac{1}{12x^2-3}\right)}$ $\frac{3(4x^2-1)}{(x-1)}$

31. $\dfrac{\left(\frac{1}{x+1}+\frac{1}{2}\right)}{\left(\frac{3}{2x^2+4x+2}\right)}$ $\frac{(x+5)}{x}$

32. $\dfrac{\left(\frac{x}{x-3}-\frac{2}{3}\right)}{\left(\frac{10}{3x}+\frac{x^2}{x-3}\right)}$ $\frac{x(x+6)}{(3x^3+10x-30)}$

33. $\dfrac{\left(\frac{1}{2x}-\frac{6}{x+5}\right)}{\left(\frac{x}{x-5}+\frac{1}{x}\right)}$ $\frac{(-11x+5)(x-5)}{2(x+5)(x^2-x-5)}$

34. $\dfrac{\left(\frac{4}{x^2-9}+\frac{2}{x-3}\right)}{\left(\frac{1}{x+3}+\frac{1}{x-3}\right)}$

In Exercises 35–40, solve the equation.

35. $\dfrac{\left(\frac{4}{x}+\frac{6}{x+1}\right)}{\left(\frac{3}{x+1}-5\right)}=-1$ $x=2$

36. $\dfrac{\left(\frac{3}{x-2}+2\right)}{\left(\frac{2x-3}{x-2}+\frac{2x}{3}\right)}=1$ $x=3,1$

37. $\dfrac{\left(x-\frac{5x+3}{x-1}\right)}{\left(\frac{2x}{2x-2}-\frac{x}{2}\right)}=-2$ $x=-1$

38. $\dfrac{\left(\frac{3x}{x-1}-\frac{4}{x}\right)}{\left(\frac{1}{2x}-\frac{1}{x}\right)}=16$ $x=\frac{2}{3},-2$

39. $\dfrac{\left(\frac{x}{x-2}+\frac{7}{x}\right)}{\left(6-\frac{12}{x}\right)}=-1$ $x=\frac{10}{7},1$

40. $\dfrac{\left(\frac{x+4}{5}-3\right)}{\left(\frac{1}{2}+\frac{x+4}{10}\right)}=-2$ $x=1$

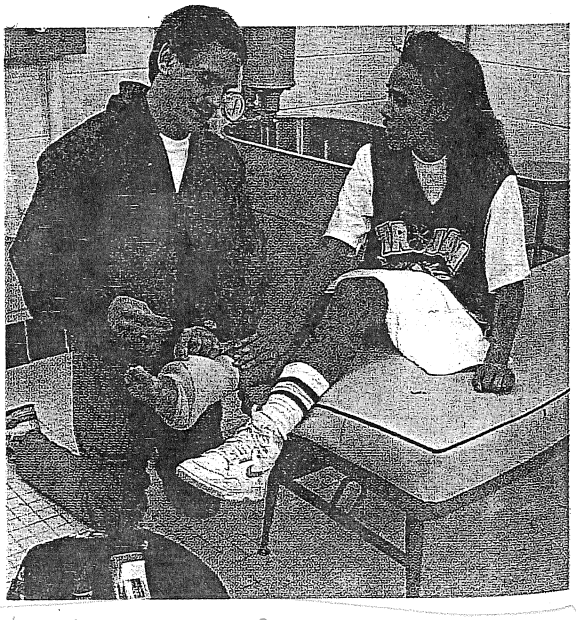
Doctors **In Exercises 41 and 42, use the following information.**

For 1970 to 1990, the number of doctors of medicine, M (in thousands), in the United States can be approximated by

$$M=\frac{28{,}390+693t}{85-t},$$

where $t=0$ represents 1970. The number of doctors of osteopathy, B (in thousands), can be approximated by

$$B=\frac{776-12t}{55-2t}.$$



41. Write an expression for the total number, I, of doctors of medicine (MD) and doctors of osteopathy (DO). Simplify the result.

42. How many MDs and DOs did the United States have in 1985?

$\approx 554{,}000$, $\approx 24{,}000$

#41 $I=\frac{-1374t^2-20{,}461t+1{,}627{,}410}{(85-t)(55-2t)}$